



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
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Refer to:
OSB2001-0193-FEC

September 12, 2001

Patricia Smith
Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland OR 97208-3621

Re: Endangered Species Act Formal Section 7 Consultation and Magnuson-Stevens Act
Essential Fish Habitat Consultation for the Mission Creek Culvert Replacement and
Stream Crossing Project, Umatilla County, Oregon

Dear Ms. Smith:

Enclosed is a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) that addresses the proposed Mission Creek Stream Crossing Enhancement Project near the City of Pilot Rock, Umatilla County, Oregon. The NMFS concludes in this Opinion that the proposed action is not likely to jeopardize Middle Columbia River (MCR) steelhead or destroy, or adversely modify their critical habitat. This Opinion includes reasonable and prudent measures with terms and conditions that are necessary and appropriate to minimize the potential for incidental take associated with this project.

This document also serves as consultation on Essential Fish Habitat (EFH) for chinook salmon under Public Law 104-267, the Sustainable Fisheries Act of 1996, as it amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). An EFH analysis is required for chinook salmon.

Questions regarding this Opinion should be directed to Eric Murray of the Oregon Habitat Branch's La Grande Field Office at 541.962.8606.

Sincerely,

Michael R. Crouse

Donna Darm
Acting Regional Administrator



Endangered Species Act - Section 7 Consultation
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation

BIOLOGICAL OPINION

Mission Creek Stream Crossing Enhancement Project
Mission Creek Drainage, Mission Creek Watershed
Umatilla River Basin, Umatilla County, Oregon

Agency: Bonneville Power Administration

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region

Date Issued: September 12, 2001

Refer to: OSB2001-0193-FEC

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1. ENDANGERED SPECIES ACT

1.1 Background

The National Marine Fisheries Service (NMFS) received a letter dated April 11, 2001, from the Bonneville Power Administration (BPA) requesting formal consultation regarding the potential effects of stream crossing improvements on Mission Creek, a tributary of the Umatilla River, on Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*) and their designated critical habitat. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) plans to conduct the proposed action as part of their Umatilla River Basin Anadromous Fish Habitat Enhancement Project. Mission Creek is a tributary of the Umatilla River in Umatilla County of northeastern Oregon.

The proposed action is to provide funding to replace an existing 6-foot diameter culvert where St. Andrews Mission Road crosses Mission Creek, and improve a low-water stream crossing site located 285 feet downstream of the culvert. The existing culvert is set at a lower gradient than the stream channel resulting in a three foot drop at the downstream end. This drop presents a significant barrier to adult and juvenile steelhead. Recent surveys conducted by the CTUIR found steelhead juveniles in the stream section below the culvert. The evidence suggests that the existing culvert is also resulting in higher stream velocities and increased bank erosion in the channel section below the culvert. The bankfull channel is approximately 20 feet wide above the culvert and only 10 feet wide below the culvert.

The MCR steelhead were listed under the ESA on March 25, 1999 (64 FR 14517). The proposed action is within MCR steelhead critical habitat, which was designated February 16, 2000 (65 FR 7764). Protective regulations were issued for MCR steelhead under section 4(d) of the ESA on July 10, 2000 (65 FR 42422).

The objective of this Opinion is to determine whether the action to improve stream crossings on Mission Creek in Umatilla County is likely to jeopardize the continued existence of MCR steelhead or destroy or adversely modify their critical habitat.

1.2 Proposed Action

The replacement culvert will be an open-bottomed arch design with a 13-foot span and a 5-foot 1-inch rise. This structure will be assembled on site by joining together 0.125-inch aluminum alloy plates. The open bottom design will maintain the natural streambed and gradient and the culvert is designed to pass a 100-year flood event. The installation of the new culvert will require reshaping of the existing streambed to the proper gradient and placement of concrete footings that will serve as the foundation for the new culvert. A track-mounted excavator with an opposable thumb will be used during project construction to minimize damage to instream habitat and riparian vegetation. The replacement will significantly improve fish passage at this site. The design will also help to maintain the natural stream width and prevent further effects on local flow velocity and scour downstream of this crossing. Construction activities for the culvert

replacement will take place during the standard instream work window set by the CTUIR Watter Resources Department for Indian Reservation Lands (July 1 to October 31). Steelhead spawning activity has not been observed by CTUIR biologists in this section of Mission Creek (Amy Sexton, CTUIR, pers. comm.). Juvenile fish stranded in the plunge pool beneath the existing culvert will be salvaged and relocated by a CTUIR Natural Production electrofishing crew. Fish will be relocated to a stream section upstream of the action area.

The second activity associated with this project is the improvement of an existing stream crossing on private land, 285-feet downstream of the culvert replacement. The crossing is used infrequently and only by the landowner to access agricultural fields. It is eroding and destabilized. To improve the low-water crossing, sections of a Geoweb cellular confinement system will be buried in the streambed. During construction, channel and bank material will be excavated so the top of the Geoweb section is flush with the grade of the channel and bank. A geotextile underlayer will be installed on the prepared gravel surface of the streambed, ensuring the required overlaps are maintained and the outer edges of the geotextile are buried a minimum of six inches below the grade. Then each section of Geoweb will be anchored, expanded, and filled with angular crushed gravel. Overfill gravel will be placed to a depth of two inches over the top of the Geoweb sections. Because the Geoweb grid has side perforations, subsurface water will be able to flow freely through the gravel substrate. A full-spanning u-shaped boulder weir grade control structure will be constructed at the downstream edge of the stream crossing. This structure is designed to remove excess stress from the banks and direct the flow toward the center of the stream. All construction activities will take place during the CTUIR instream work window of July 1 to October 31.

1.3 Biological Information and Critical Habitat

Biological information concerning the MCR steelhead is found in Busby et al. (1996). The current status of the MCR steelhead, based on their risk of extinction, has not significantly improved since the species was listed. Within the Umatilla basin, returns of adult wild summer steelhead have declined from highs of 2,816 in 1986 and 3,296 in 1987 to an average of 963 from 1995 to 1997. Hatchery steelhead, developed from wild Umatilla broodstock, were introduced to the Umatilla River basin in the late 1980s. This increased the percentage of the summer steelhead of hatchery origin from 17% of the total adult returns in 1990 to 62% in 1997 (Chilcote, 1998).

Critical habitat for MCR steelhead encompasses the major Columbia River tributaries known to support this ESU, including the Deschutes, John Day, Klickitat, Umatilla, Walla Walla, and Yakima Rivers, as well as the Columbia River and estuary. Critical habitat consists of all waterways below long-standing (100 years or more), naturally impassable barriers. The adjacent riparian zone is also considered critical habitat. This zone is defined as the area that provides the following functions: Shade, sediment, nutrient/chemical regulation, streambank stability, and input of large woody debris/organic matter.

Mission Creek provides rearing and possibly spawning habitat for both adult and juvenile life stages of MCR steelhead. Adult MCR steelhead enter the Columbia River beginning in the spring and migrate upriver through the summer, fall, and winter, seeking their tributary of origin. By early the next spring the adults have reached their natal streams and spawn in gravel redds/nests from March to early June. Deposited eggs usually hatch by the July of the same year. The resulting juveniles will spend from one to four years rearing to smolt size at which time they will begin their migration to the ocean. Mission Creek has ideal cool rearing temperatures for juvenile steelhead all year and juvenile steelhead are expected to be rearing in the project area during all phases of this project.

Essential features of the adult spawning, juvenile rearing, and adult and migratory habitat for this species are: 1) Substrate, 2) water quality, 3) water quantity, 4) water temperature, 5) water velocity, 6) cover/shelter, 7) food (juvenile only), 8) riparian vegetation, 9) space, and 10) safe passage conditions. The essential features that the proposed project may affect are substrate, water quality, water temperature, water velocity, cover/shelter, food, and riparian vegetation.

1.4 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NMFS must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of: 1) Defining the biological requirements and current status of the listed species; and 2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NMFS must consider the estimated level of mortality attributable to: 1) Collective effects of the proposed or continuing action; 2) the environmental baseline; and 3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NMFS finds that the action is likely to jeopardize the listed species, NMFS must identify reasonable and prudent alternatives for the action.

Furthermore, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' designated critical habitat and NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. The NMFS identifies those effects of the action that impair the function of any essential element of critical habitat. The NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will destroy or adversely modify critical habitat it must identify any reasonable and prudent alternatives available.

For the proposed action, NMFS' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NMFS' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for juvenile and adult migration, spawning, and rearing of the MCR steelhead under the existing environmental baseline.

1.4.1 Biological Requirements

The first step in the methods the NMFS uses for applying the ESA section 7(a)(2) to listed MCR steelhead is to define the species' biological requirements that are most relevant to each consultation. NMFS also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NMFS starts with the determinations made in its decision to list MCR steelhead for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for MCR steelhead to survive and recover to naturally reproducing population levels at which protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment. For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration, spawning and rearing.

MCR steelhead survival in the wild depends on the proper functioning of certain ecosystem processes including habitat formation and maintenance. The restoration of improperly functioning habitat to a more properly functioning condition will likely lead to improved survival and recovery of MCR steelhead. In conducting analyses of habitat altering actions, NMFS defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and applies a "habitat" approach to its analysis (NMFS 1999). The current status of MCR steelhead, based on their risk of extinction, has not improved much since the species was listed.

1.4.2 Environmental Baseline

The current range-wide status of the identified ESU is found in Busby et al. (1995, 1996). The identified action will occur within the range of MCR steelhead. The defined action area is the area that is directly and indirectly affected by the proposed action. The direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, stream hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect effects may occur throughout the watershed, where actions described in this biological opinion lead to additional activities, or affect ecological functions, contributing to stream degradation. As such, the action area for the proposed activities include the immediate portions of the watershed containing the project and those areas upstream and downstream that may reasonably be affected, temporarily or in the long term, by the proposed project. For this project, the action area would be the area 100 feet above the culvert replacement downstream to

the stream crossing improvement, continuing downstream to the extent of sediment introduced by the activities, approximately one mile.

Mission Creek is a small tributary to the Umatilla River and runs entirely through the Umatilla Indian Reservation. The average annual precipitation ranges from 16 to 24 inches with most of it falling as rain between October and March. The annual hydrograph for Mission Creek can be described as “flashy” since the majority of the surface flow occurs in March and April and then tapers off to low flows during the summer. Many sections of the channel may become dry in the summer. Several springs act as major water sources during the summer season and stream temperatures rarely exceed 60° F.

Riparian areas of Mission Creek are in relatively poor condition with grasses being the dominant vegetation and a significant amount of bare soil exposed (24% of transects conducted by CTUIR). Hardwoods are the dominant tree type but their density is low, approximately 2.9 trees/100m²). Consequently, instream wood debris levels are low and instream cover is generally lacking in Mission Creek. Lack of instream cover and perennial stream flows are the limiting factors to anadromous fish production in the area. Also, several natural passage barriers for fish exist above and below the project, particularly during periods of low flow. Artificial barriers to fish passage are the bridge at rivermile (RM) 1.4 and the culvert associated with this project.

Sediment input to Mission Creek comes from several sources. Agriculture fields adjacent to the stream are often exposed during the winter and can serve as a source of both sediment, excess nutrients, and contaminants in the form of pesticide residues and fertilizers. Eroding banks along the stream channel also contribute significant amounts of sediment to the stream. In general, Mission Creek can be considered highly degraded, with temperature being the only indicator in the matrix of pathways and indicators in a properly functioning condition.

1.5 Analysis of Effects

1.5.1 Effects of Proposed Action

The purpose of the proposed action, as described in section 1.2 of this Opinion is to replace an existing pipe culvert with a bottomless arch culvert and improve a stream crossing on private land downstream of the culvert. The completion of these actions should improve fish passage.

The effects determination in this Opinion was made using a method for evaluating current aquatic conditions, the environmental baseline, and predicting effects of actions on them. This process is described in *Making Endangered Species Act determinations of effect for individual and grouped actions at the watershed scale* (NMFS 1996). The effects of actions are expressed in terms of the expected effect (restore, maintain, or degrade) on aquatic habitat factors in the action area. For the proposed actions, all conditions for Mission Creek will be maintained except for physical barriers which should be restored. NMFS does expect some negative effects in the short term. Specific effects are discussed below.

Potential short term negative effects to MCR steelhead will result from this project. Increased sediment levels can be expected to occur due to the instream work associated with the culvert replacement and the stream crossing improvement. The short-term increase in turbidity could result in temporary reduction in feeding efficiency for juvenile steelhead within the action area. Increased sedimentation may also lead to increased embeddness of spawning substrates downstream of the project. However, this may not be a major concern due to the lack of current spawning activity in Mission Creek. Instream work scheduled for this project will take place during the 1 July- 31 October CTUIR in-water work window. Due to the typically low flows present in Mission Creek during this time, sedimentation rates are expected to be minimal. Disturbance of riparian vegetation could result from operation of heavy machinery near the stream and could lead to decreased shade and increased water temperatures until riparian vegetation is re-established. There is also the potential for fuel or other contaminant spills associated with use of heavy equipment in or near the stream.

The fish salvage operation to be conducted in the pool beneath the existing culvert will result in disturbance and stress to listed steelhead. Stress approaching or exceeding the physiological tolerance limits of individual fish can impair reproductive success, growth, resistance to infectious diseases, and general survival (Wedemeyer *et al.* 1990). Mechanical injury is also possible during holding, netting, or electroshocking. Many factors influence the relative effects of electrofishing on fish including conductivity of water, depth of water, substrate, and size of the fish. Additionally, the amount of time taken to complete electrofishing within the sample area, the frequency of sampling through time, crew efficiency, and operator skill have been identified as factors influencing the magnitude of electrofishing effects.

1.5.2 Cumulative Effects

“Cumulative effects” are defined in 50 CFR 402.02 as those of “future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.” The action area for this consultation includes the streambed and streambank, including riparian areas, of Mission Creek within the area of the project site and for a short distance upstream and downstream. The agricultural practices that have contributed to the degradation of Mission Creek will most likely continue for the foreseeable future. The NMFS is not aware of other actions affecting this area.

1.6 Conclusion

NMFS has determined that, when the effects of the crossing improvement activities and actions associated with this project are added to the environmental baseline and the cumulative effects occurring in this area, it is not likely to jeopardize the continued existence of MCR steelhead. Additionally, NMFS concludes that the subject action would not cause adverse modification or destruction of critical habitat for MCR steelhead. NMFS believes that the proposed action will cause some minor short-term increases in stream turbidity and sedimentation rates in Mission Creek. It is also possible that some direct mortality of juvenile steelhead may result from the instream work. The fish salvage operation is likely to result in stress to listed steelhead and some

direct mortality. However, because of precautions planned for this salvage operation, mortality is expected to be minimal. These short-term negative effects will be offset in the long term through fish passage improvement.

NMFS' conclusions are based on the following considerations: 1) All instream work will occur during the CTUIR instream work window for this area (July 1- October 31), and instream work will be limited to the amount described in the BA; 2) all disturbed soils will be replanted with native vegetation; 3) fish salvage operations, following NMFS protocol, will be conducted by experienced CTUIR staff; 4) fish passage in Mission Creek will improve due to the project activities.

1.7 Conservation Recommendations

Section 7 (a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of proposed actions on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. The NMFS has no additional conservation recommendations regarding the action addressed in this Opinion.

1.8 Reinitiation of Consultation

Reinitiation of consultation is required if: 1) The action is modified in a way that causes an effect on the listed species that was not previously considered in the BA and this Opinion; 2) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; or 3) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

2. INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.1 Amount or Extent of the Take

NMFS anticipates that the proposed action has more than a negligible likelihood of resulting in incidental take of species listed in this Opinion because of detrimental effects from increased sediment and pollutant levels (non-lethal), reduced benthic invertebrate production (non-lethal), riparian habitat disturbance (non-lethal), and the capture and release of any juvenile fish necessary to isolate the in-water work area (lethal and non-lethal).

Effects of actions such as minor sedimentation and minor riparian disturbance are unquantifiable in the short term and are not expected to be measurable as long-term harm to habitat features or by long-term harm to salmonid behavior or population levels. Therefore, even though NMFS expects some low level incidental take to occur due to the construction actions other than isolating the work area covered by this Opinion, best scientific and commercial data available are not sufficient to enable NMFS to estimate the specific amount of incidental take to the species itself. In instances such as these, NMFS designates the expected level of take as "unquantifiable." Based on the information in the biological assessment, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the habitat altering actions covered by the Opinion. The extent of the take includes the aquatic and associated riparian habitats affected by the culvert replacement and stream crossing improvement extending upstream to the edge of disturbance, and downstream 300 feet.

Unlike general habitat effects, the effects of isolating the work area from the flowing waters of the Mission Creek could result in minor incidental lethal take of MCR steelhead that can be quantified based on the results of past salvage operations involving ODFW. NMFS anticipates that an incidental take of up to 20 juvenile MCR steelhead could occur because of isolating the work area as described in this Opinion. The extent of take is limited to MCR steelhead in the Mission Creek.

2.2 Effect of Take

In the accompanying biological opinion, the NMFS determined that this level of anticipated take is not likely to result in jeopardy to MCR steelhead considered in the biological opinion or result in the destruction or adverse modification of critical habitat.

2.3 Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of the above species. Minimizing the amount and extent of take is essential to avoid jeopardy to the listed species.

1. Minimize the likelihood of incidental take from activities involving temporary access roads, use of heavy equipment, earthwork, site restoration, or that may otherwise involve in-water work or affect fish passage by avoiding or minimizing disturbance to riparian and aquatic systems.
2. Ensure that conservation measures are effective in minimizing incidental take by monitoring results of permitted activities.

2.4 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the BPA must comply with the following terms and conditions, which carry out the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement Reasonable and Prudent Measure #1 (construction) above, the BPA shall ensure that:
 - a. Minimum area. Construction impacts will be confined to the minimum area necessary to complete the project.
 - b. In-water work. All work within the active channel that could contribute sediment or toxicants downstream will be completed within the ODFW approved in-water work period.¹ Work will be completed from the bank to minimize disturbance of the stream bottom; no equipment will be allowed into the active wetted channel.
 - c. Work period extensions. Extensions of the in-water work period, including those for work outside the wetted perimeter of the stream but below the ordinary high water mark must be approved by biologists from NMFS.
 - d. Isolation of in-water work area. During in-water work, if listed fish may be present, including incubating eggs or juveniles, and the project involves either significant channel disturbance or use of equipment instream, ensure that the work area is well isolated from the active flowing stream within a cofferdam (made out of sandbags, sheet pilings, inflatable bags, etc.), or similar structure, to minimize the potential for sediment entrainment. Furthermore, no ground or substrate disturbing action will occur within the active channel 300 feet upstream of potential spawning habitats as measured at the thalweg without isolation of the work area from flowing waters.

¹ Oregon Department of Fish and Wildlife, *Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*, 12 pp (June 2000)(identifying work periods with the least impact on fish)(http://www.dfw.state.or.us/ODFWhtml/InfoCntrHbt/0600_inwtrguide.pdf).

- i. Fish screen. Any water intake structure authorized under this Opinion must have a fish screen installed, operated and maintained according to NMFS' fish screen criteria.²
- ii. Seine and release. Before and intermittently during pumping attempts will be made to seine and release, or electrofish and release, fish from the work isolation area as is prudent to minimize risk of injury.
 - (1) Seining or electrofishing will be conducted by CTUIR personnel familiar with such efforts and all staff working with the operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.
 - (2) If electrofishing is used, it must be consistent with NMFS electrofishing guidelines, attached to this Opinion as Appendix A.
 - (3) ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining or electrofishing and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever necessary to prevent the added stress of an out-of-water transfer.
 - (4) Seined or electrofished fish must be released as near as possible to capture sites.
 - (5) The transfer of any ESA-listed fish from the applicant to third-parties other than NMFS personnel requires written approval from the NMFS.
 - (6) The applicant must obtain any other Federal, state, and local permits and authorizations necessary for the conduct of the seining or electrofishing activities.
 - (7) The applicant must allow the NMFS or its designated representative to accompany field personnel during the seining or electrofishing activity, and allow such representative to inspect the applicant's seining or electrofishing records and facilities.
 - (8) A description of any seine or electrofish and release effort will be included in a post-project report, including the name and address of the supervisory fish biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions prior to and following placement and removal of barriers; the means of fish removal; the number of fish removed by species; the condition of all fish released, and any incidence of observed injury or mortality.

² Nation Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996)(guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (<http://www.nwr.noaa.gov/1hydroweb/hydroweb/ferc.htm>).

- iii. Water pumped from the work isolation area will be discharged into an upland area providing over ground flow before returning to the creek. Discharge will occur so that it does not cause erosion. Discharges into potential fish spawning areas or areas with submerged vegetation are prohibited.
- e. Fish passage. Work will not inhibit passage of any adult or juvenile salmonid species throughout the construction period or after project completion. All culvert and road designs must comply with ODFW guidelines and criteria for stream-road crossings³ with appropriate grade controls to prevent culvert failure due to changes in stream elevation. Channel modifications which could adversely affect fish passage, such as by increasing water velocities, are not authorized by this Opinion.
- f. Pollution and erosion control plan. A Pollution and Erosion Control Plan (PECP) will be developed for each authorized project to prevent point-source pollution related to construction operations. The PECP will contain the pertinent elements listed below and meet requirements of all applicable laws and regulations.
 - i. Methods that will be used to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.
 - ii. Methods that will be used to confine and remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.
 - iii. A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.
 - iv. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.
 - v. Measures that will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.
- g. Temporary access roads. Temporary access roads are designed as follows:
 - i. Existing roadways or travel paths will be used whenever reasonable.
 - ii. Where stream crossings are essential, a survey must determine and map any potential spawning habitat within 1,000 feet upstream and downstream.

³ Appendix A, Oregon Department of Fish and Wildlife Guidelines and Criteria for Stream-Road Crossings, in: G.E. Robison, A. Mirati, and M. Allen, *Oregon Road/Stream Crossing Restoration Guide: Spring 1999* (rules, regulations and guidelines for fish passage through road/stream crossings under the Oregon Plan) (<http://www.nwr.noaa.gov/1salmon/salmesa/4ddocs/orfishps.htm>).

- iii. No stream crossings will occur at known or suspected spawning areas or within 300 feet upstream of such areas where impacts to spawning areas may occur.
- iv. Where stream crossings are essential, the crossing design will accommodate reasonably foreseeable risks (e.g., flooding and associated bedload and debris) to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.
- v. Vehicles and machinery must cross riparian areas and streams at right angles to main the main channel wherever reasonable.
- vi. Temporary roads within 150 feet of streams will avoid, minimize and mitigate soil disturbance and compaction by clearing vegetation to ground level and placing clean gravel over geotextile fabric.
- vii. The number of stream crossings is minimized.
- h. Cessation of work. All project operations, except efforts to minimize storm or high flow erosion, will cease under high flow conditions that may result in inundation of the project area.
- i. Pre-construction activities. Before significant alteration of the action area, the following actions will be accomplished.
 - i. Boundaries of the clearing limits associated with site access and construction are flagged to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.
 - ii. The following erosion control materials are onsite.
 - (1) A supply of erosion control materials (e.g., silt fence and straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.
 - (2) An oil absorbing, floating boom is available on-site during all phases of construction whenever surface water is present.
 - iii. All temporary erosion controls (e.g., straw bales, silt fences) are in-place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in-place at all times during the contract, and will remain and be maintained until permanent erosion control measures are effective.
- j. Heavy Equipment. Heavy equipment use will be restricted as follows.
 - i. When heavy equipment is required, the applicant will use equipment having the least impact (e.g., minimally sized, rubber tired).
 - ii. Excavators will have properly guarded belly pan for pioneering type of work in rough terrain.
 - iii. Heavy equipment will be fueled, maintained and stored as follows.
 - (1) All equipment that is used for instream work will be cleaned before operations below the bankfull elevation. External oil and grease will be removed, along with dirt and mud. No untreated wash and

- rinse water will be discharged into streams and rivers without adequate treatment.
- (2) Place vehicle staging, maintenance, refueling, and fuel storage areas a minimum of 150 feet horizontal distance from any stream.
 - (3) All vehicles operated within 150 feet of any stream or water body will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation.
 - (4) When not in use, vehicles will be stored in the vehicle staging area.
- k. Site preparation. Site preparation is completed in the following manner, including removal of stream materials, topsoil, surface vegetation and major root systems.
- i. Any instream large wood or riparian vegetation moved or altered during construction will stay on the site or be replaced with a functional equivalent.
 - ii. Tree removal will be mitigated for onsite by a 2:1 replanting ratio.
 - iii. Whenever the project area is to be revegetated or restored, native channel material, topsoil and native vegetation removed for the project should be stockpiled for redistribution on the project area.
- l. Earthwork. Earthwork, including drilling, blasting, excavation, dredging, filling and compacting, is completed in the following manner:
- i. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained from outside the riparian area.
 - ii. Material removed during excavation will only be placed in locations where it cannot enter streams or other water bodies.
 - iii. All exposed or disturbed areas will be stabilized to prevent erosion.
 - (1) Areas of bare soil within 150 feet of waterways, wetlands or other sensitive areas will be stabilized by native seeding,⁴ mulching, and placement of erosion control blankets and mats, if applicable, quickly as reasonable after exposure, but within seven days of exposure.
 - (2) All other areas will be stabilized quickly as reasonable, but within 14 days of exposure.
 - (3) Seeding outside the growing season will not be considered adequate nor permanent stabilization.
 - iv. All erosion control devices will be inspected during construction to ensure that they are working adequately.
 - (1) Erosion control devices will be inspected daily during the rainy season, weekly during the dry season, monthly on inactive sites.

⁴ By Executive Order 13112 (February 3, 1999), Federal agencies are not authorized to permit, fund or carry out actions that are likely to cause, or promote, the introduction or spread of invasive species. Therefore, only native vegetation that is indigenous to the project vicinity, or the region of the state where the project is located, shall be used.

- (2) If inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately, during working and off-hours, to make repairs, install replacements, or install additional controls as necessary.
 - (3) Erosion control measures will be judged ineffective when turbidity plumes are evident in waters occupied by listed salmonids during any part of the year.
- v. If soil erosion and sediment resulting from construction activities is not effectively controlled, the engineer will limit the amount of disturbed area to that which can be adequately controlled.
- vi. Sediment will be removed from sediment controls once it has reached 1/3 of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 5 inches (12 cm). Catch basins will be maintained so that no more than 6 inches (15 cm) of sediment depth accumulates within traps or sumps.
- vii. Sediment-laden water created by construction activity will be filtered before it leaves the right-of-way or enters a stream or other water body. Silt fences or other detention methods will be installed as close as reasonable to culvert outlets to reduce the sediment entering aquatic systems.
- m. Site restoration. Site restoration and cleanup, including protection of bare earth by seeding, planting, mulching and fertilizing, is done in the following manner.
 - i. All damaged areas will be restored to pre-work conditions including restoration of original streambank lines, and contours.
 - ii. All exposed soil surfaces, including construction access roads and associated staging areas, will be stabilized at finished grade with mulch, native herbaceous seeding, and native woody vegetation before October 1. On cut slopes steeper than 1:2, a tackified seed mulch will be used so that the seed does not wash away before germination and rooting occurs. In steep locations, a hydro-mulch will be applied at 1.5 times the normal rate.
 - iii. Disturbed areas will be planted with native vegetation specific to the project vicinity or the region of the state where the project occurs, and will comprise a diverse assemblage of woody and herbaceous species.
 - iv. Plantings will be arranged randomly within the revegetation area.
 - v. All plantings will be completed before April 15.
 - vi. No herbicide application will occur within 300 feet of any stream channel as part of this permitted action. Mechanical removal of undesired vegetation and root nodes is permitted.
 - vii. No surface application of fertilizer will be used within 50 feet of any stream channel as part of this permitted action.
 - viii. Fencing will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
 - ix. Plantings will achieve an 80 percent survival success after three years.

- (1) If success standard has not been achieved after three years, the applicant will submit an alternative plan to the BPA. The alternative plan will address temporal loss of function.
 - (2) Plant establishment monitoring will continue and plans will be submitted to the BPA until site restoration success has been achieved.
 - n. CTUIR Personnel. CTUIR personnel will be on-site for all construction and monitoring activities to ensure that these terms and conditions are met.
2. To implement Reasonable and Prudent Measure #2 (monitoring and reporting), above, the BPA shall submit a report to the NMFS within one year of completing the project. This report will consist of the following information:
- a. Project identification.
 - i. Permit number;
 - ii. applicant's name;
 - iii. project name;
 - iv. project location by 5th field hydrological unit code (HUC) and latilong;
 - v. starting and ending dates for work completed; and
 - vi. the BPA contact person.
 - b. Isolation of in-water work area. All projects involving isolation of in-water work areas must include a report of any seine and release activity including:
 - i. The name and address of the supervisory fish biologist;
 - ii. methods used to isolate the work area and minimize disturbances to ESA-listed species;
 - iii. stream conditions before and following placement and removal of barriers;
 - iv. the means of fish removal;
 - v. the number of fish removed by species;
 - vi. the location and condition of all fish released; and
 - vii. any incidence of observed injury or mortality.
 - c. Pollution and erosion control. A summary of all pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.
 - d. Site restoration. Documentation of the following conditions:
 - i. Finished grade slopes and elevations.
 - ii. Log and rock structure elevations, orientation, and anchoring, if any.
 - iii. Planting composition and density.
 - iv. A plan to inspect and, if necessary, replace failed plantings and structures for five years.
 - v. A narrative assessment of the project's effects on natural stream function.
 - e. Photographic documentation of environmental conditions at the project sites before, during and after project completion.

- i. Photographs will include general project location views and close-ups showing details of the project area and project, including pre and post construction.
- ii. Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
- iii. Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.
- f. The annual report will be submitted to:

Branch Chief - Portland
National Marine Fisheries Service
Attn: OSB2001-0193-IEC
525 NE Oregon Street, Suite 500
Portland, OR 97232

- g. NOTICE. If a dead, injured, or sick endangered or threatened species specimen is found, initial notification must be made to the National Marine Fishery Service Law Enforcement Office, at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360/418-4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. Besides the care of sick or injured endangered and threatened species, or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence with the specimen is not unnecessarily disturbed.

3. MAGNUSON-STEVENSON ACT

3.1 Background

The objective of the Essential Fish Habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH

descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NMFS on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA [6 USC 1855(b)] requires that:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NMFS shall provide conservation recommendations for any Federal or State Activity that may adversely affect EFH;
- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall explain its reason for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.3 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these

species' EFH from the proposed action is based on this information. Although past of their historical range there, is currently no chinook salmon present in Mission Creek.

3.4 Proposed Action

The proposed action is detailed above in Section 1.2 of the ESA portion of this Opinion. The action area includes a section of Mission Creek where stream crossing improvements are being made. This area has been designated as EFH for various life stages of chinook salmon.

3.5 Effects of Proposed Action

As described in detail in the ESA portion of this consultation, the proposed activities may result in detrimental, short-term, adverse effects to a variety of habitat parameters.

3.6 Conclusion

NMFS believes that the proposed action may adversely affect the EFH for chinook salmon.

3.7 EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. In addition to conservation measures proposed for the project by the BPA and CTUIR, all of the Reasonable and Prudent Measures and the Terms and Conditions contained in Section 2.4 of the ESA portion of this Opinion are applicable to salmon EFH. Therefore, NMFS incorporates each of those measures here as EFH conservation recommendations.

3.8 Statutory Response Requirement

Please note that the Magnuson-Stevens Act (section 305(b)) and 50 CFR 600.920(j) requires the BPA to provide a written response to NMFS' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. If the response is inconsistent with NMFS' conservation recommendations, the reasons for not implementing the BPA shall explain its reasons for not following the recommendations.

3.9 Consultation Renewal

The BPA must reinitiate EFH consultation with NMFS if either action is substantially revised or new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion.

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Wedemeyer, G.A., B.A. Barton, and D.J. McLeay. 1990. Stress and acclimation. Pages 451-490 in C.B. Schreck and P.B. Moyle, editors. Methods for fish biology. American Fisheries Society, Bethesda, Maryland.

ELECTROFISHING GUIDELINES

Suggested protocol for the use of backpack electrofishing equipment in waters containing fish listed under the Endangered Species Act (ESA). These recommendations should be seen as guidelines for developing consistent and safe electrofishing technique. It is hoped that these guidelines will ultimately help improve electrofishing technique in ways which will reduce fish injury and increase electrofishing efficiency.

Purpose and Scope

The purpose of this document is to recommend guidelines for using backpack electrofishing equipment to sample ESA-listed fish. Because electrofishing can kill or severely injure fish, every effort should be made to avoid electrofishing and use snorkeling or other fishery information collection techniques. Where electrofishing is the only suitable sampling method, these guidelines are suggested to help reduce the number of fish killed or severely injured. These guidelines are concerned only with studies that involve electrofishing juvenile or adult salmonids that are *not* in spawning condition. Electrofishing in the vicinity of adults in spawning condition or operating equipment in the vicinity of redds containing developing eggs is not discussed as there is no justifiable basis for permitting these activities near listed species. Also, these guidelines do not deal with factors such as temperature or fish handling technique both of which can significantly affect fish health during an electrofishing session. None the less, all ESA-listed fish must be sampled with extreme care. The field crew must carefully design the sampling sessions to minimize fish stress by working within favorable temperature regimes, using anesthetics when necessary, and minimizing the time the fish are held before release. As with all fieldwork involving live ESA-listed fish, the best science should be used along with an experienced crew and good equipment in order to minimize handling stress.

Equipment

Equipment should be in good working condition. Operators should go through the manufacturer's preseason checks, adhere to all provisions, and record major maintenance work in a log.

Training

A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment should train the crew. The crew leader's experience must be documented and available for confirmation; such documentation may be in the form of a logbook. The training should occur before an inexperienced crew begins any electrofishing; it should also be conducted in waters that do not contain ESA-listed fish.

The training program must include the following elements:

1. Definitions of basic terminology: e.g. galvanotaxis, narcosis, and tetany.
2. An explanation of how electrofishing attracts fish.
3. An explanation of how gear can injure fish and how to recognize signs of injury.
4. A review of these guidelines and the manufacturer's recommendations.
5. A demonstration of the proper use of electrofishing equipment, the role each crew member performs, and basic gear maintenance.
6. A field session where new individuals actually perform each role on the electrofishing crew.

Specific Electrofishing Guidelines

1. In order to avoid contact with spawning adults or active redds, carefully survey the area to be sampled before beginning electrofishing.
2. Measure conductivity and set voltage as follows:

<u>Conductivity (umhos/cm)</u>	<u>Voltage</u>
Less than 100	900 to 1100
100 to 300	500 to 800
Greater than 300	150 to 400

3. Only direct current (DC) should be used.
4. Each session should begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500 us and do not exceed 5 milliseconds. Pulse rate should start at 30Hz and work carefully upwards. *In general*, exceeding 40 Hz will injure more fish.
5. The zone of potential fish injury is 0.5m from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated because in such areas the fish are more likely to come into close contact with the anode.
6. The stream segment should be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

7. Crew should carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. Sampling should be terminated if injuries occur or abnormally long recovery times persist.
8. When the sampling design involves taking scales and measurements, a healthy environment for the stressed fish must be provided and the holding time must be minimized. For these operations, additional crew members who are experienced in holding and processing stressed fish may be necessary.
9. Whenever possible, a block net should be placed below the area being sampled to capture stunned fish that may drift downstream.
10. The electrofishing settings should be recorded in a logbook along with conductivity, temperature, and other variables affecting efficiency. These notes, together with observations on fish condition, will improve technique and form the basis for training new operators.